A COGNITIVE ORGANIZATION THEORY OF ORGANIZATIONAL CHANGE

Measuring Organizational Texture, Audience Appeal, and Leadership Engagement

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Abstract

In the tradition of organizational ecology, Hannan, Pólos and Carroll (2003a, 2003b, 2007) suggested a cognitive turn in the theory of organizational change, emphasizing the role of subtle processes of appeal and engagement in determining the likelihood of organizational change success, and the subsequent impact on the organization's hazard of failure, conditional on important aspects of the organization's texture. In the current paper, we suggest a series of measures to proxy for the theory's key theoretical constructs, and run psychometric analyses with data from two pilot studies. We collected tailor-made survey data from police forces in Belgium and the UK, and provide evidence for a cognitive organization theory of organizational change.

Key Words
Organizational ecology, organizational change, and scale development.

INTRODUCTION

In the 2000s, organizational ecology (OE) took a cognitive turn, emphasizing subtle micro-level processes emerging within organizations and their populations (e.g., Hannan, Pólos, and Carroll (or HPC), 2007). OE was launched as a macro organization theory, focusing on population-level analyses of evolutionary processes, and the vital events of founding and mortality (Hannan and Freeman, 1977). The key micro theory of OE centers on relative and structural inertia, arguing that organizational inertia is both a condition for and outcome of population processes of selection (Hannan and Freeman, 1984). The central prediction of OE's inertia theory is that changes in an organization's core increase this organization's mortality likelihood. This claim is further developed in Cognitive Organization Theory (COT).

Using formal logic, HPC (2007) developed COT by taking insights from cognitive psychology and anthropology to reconstruct the foundation or core of OE, grounding macro processes of organizational legitimation, inertia and mortality in micro processes of appeal and engagement. The argument is that a few essential cognitive processes relate to external audiences that are engaged in intricate processes of appeal and engagement, which may or may not result in the legitimation of the new form or product. COT is applied to issues of organizational form emergence and new product introduction (Hsu and Hannan, 2005; Hsu et al., 2009; Bogaert et al., 2016). We add to COT by focusing on internal processes of organizational change (cf. Jacobs, Christe-Zeyse, van Witteloostuijn, 2013). Returning to the micro heart of organizational theory (Walsh, 1995), we re-conceptualize and extend COT to fine-tune the theoretical logic, relating to well-known arguments from organizational behavior (OB) literature. For instance, we argue that well-established commitment, justice and leadership concepts from OB can be linked to the COT constructs of appeal and engagement.

HPC (2003a, 2003b, 2007) explore the micro-level COT of organizational change, yet empirical studies are absent. An important reason is that many of the new COT constructs are not linked to empirical measures. Micro-level COT involves four sets of theoretical constructs. First, four features of the organization's texture determine the likely consequences of organizational change: asperity, intricacy, opacity and viscosity. Second, organizational change is argued to trigger a cascade of subsequent (unexpected) changes. Third, organizational change is claimed to be associated with (a lack of) intrinsic appeal for internal audiences, which may or may not be translated into actual appeal. Fourth, the relationship between intrinsic and actual appeal is moderated by both ex ante and ex post engagement. This paper develops scales for each of these central theoretical constructs. We collected tailor-made survey data from 16 police units in Belgium and the UK. The survey was designed to pilot data collection, using OB literature for scales that could proxy for appeal and engagement, and self-developed measures for organizational texture and change cascades aspects of COT. We run psychometric analyses to construct reliable and valid measures of COT's core constructs.

COT IN A NUTSHELL

HPC (2007) argue that change takes place in an organizational context featuring four key attributes: asperity, intricacy, opacity and viscosity. ***Asperity*** refers to the restrictiveness of culture with respect to architectural features. Cultural codes are formed around the organization's architectural codes, which restrict the architectural features that are tolerated and allowed to change. Changes to the organization's identity are especially problematic and result in strong opposition, because this implies a violation of default codes and produces normative reactions and sanctions. ***Intricacy*** relates to intra-organizational interconnectedness. Changes to organizations with an intricate pattern of subordinations typically generate longer change

cascades. One unit dominates another architecturally if the feature values of the former act as constraints (or codes) for the latter. Changes in the dominant unit induce code violations in the subordinate units. ***Opacity*** involves the structural limits on foresight of those initiating organizational change. This implies an underestimation of the length of the cascades, and in turn that of the costs and risks of change. A unit is structurally opaque to the extent that its connections cannot be readily observed from other units. ***Viscosity*** refers to the length of time a unit takes to correct induced code violations. Due to the opportunity costs associated with reorganizations, increasing the reorganization time necessarily increases the cost of the change.

The ***intrinsic appeal*** of change refers to the alignment of the goals of the change with the taste preferences of the audience segment. Because code violations lower intrinsic appeal (HPC, 2007), and the organizational texture variables increase code violations (increasing uncertainty), we hypothesize that asperity, intricacy, opacity, and viscosity lower the intrinsic appeal of change. This is COT's Proposition 1. COT further argues that this negative effect may be dampened by engagement. ***Engagement*** activities involve the development and display of credible signals of authenticity (Carroll and Swaminathan, 2000; Baron, 2004; Hsu and Hannan, 2005; HPC, 2007). This translates into two dimensions linked to the prior phase of ex post engagement. First, change leadership needs to be authentic. This requires (i) proper support for the change by management, (ii) proper implementation of the change by management, and (iii) proper communication by management. Second, organizational members should be treated in a fair and just manner, implying that (i) the costs and benefits need to be distributed fairly, (ii) people are sufficiently informed and treated in the right way, and (iii) operating procedures must be fair and appropriate. We argue that ex post engagement and the intrinsic appeal of organizational change together determine the ***actual appeal*** of the change to the internal

audience member. This is COT's Proposition 2. The actual appeal of change subsequently influences the internal audience member's attitude toward change, his or her behavioral response to change (uncertainty/resistance or support), and their subsequent evaluation of the change. Together, change-related attitude, behavior and evaluation reflect the change's actual appeal.

METHODOLOGY

We aim to develop reliable and valid survey measures of COT's key constructs. We followed a three-step procedure (e.g., Hinkin, 1998; Ferris et al., 2008). In step 1, we constructed scales with survey items by (a) using OB scales to proxy for COT constructs, to the extent available, and (b) creating self-developed potential items and scales for remaining constructs (consulting with COT experts), to maximize pre-test face validity. In step 2, we applied factor analysis to determine the convergent and discriminant validity of our scales, in the process engaging in item reduction, and the reliability of the remaining scale items is assessed with Cronbach's alpha. In step 3, we estimate a structural equation model (SEM) to evaluate external validity, exploring whether the measures have the effect hypothesized in COT.

We collected survey data in eleven police districts (units) of the second largest UK police force—Greater Manchester Police (GMP). Each district is involved in neighborhood policing, investigation (i.e., CID), intelligence, response, road policing, custody, and management. Respondents were police officer and civilian employees. We studied the Policing Model Implementation Team (PMIT) II (2013-16) change project to re-organize 11 divisions in relation to: (i) efficiency, (ii) performance, (iii) customer satisfaction, (v) capability, and (vi) sustainable processes. 579 employees responded (13% response rate). Additionally, we collected data in six Belgian police forces, engaged in neighborhood policing, reception, intervention, aid to victims, local investigations, maintaining public order, and traffic control. Respondents were police

officers and civilian employees. Four different types of changes were discussed: closer cooperation with a neighboring police force, reorganization of intervention teams, installation of a communication and cooperation tool, and a merger with a neighboring police zone. 192 employees responded (28% response rate). In all police forces, participants were invited to complete the online survey through individual emails. Anonymity and confidentiality were assured. Brislin's (1980) recommendations were followed in relation to translation and back-translation by two of the authors until consensus was reached. Because we are drawing samples from police forces in two different countries, we need to assess whether these data can be pooled in our analyses.

MEASUREMENT MODEL

We constructed self-developed items to develop scales for the four **organizational texture** features (Table 1, which includes self-created measures of change magnitude and change cascades, being critical control variables).

[TABLE 1]

Similarly, new items were developed for the **intrinsic appeal** of change, distinguishing two dimensions: (1) alignment of expectations, and (2) alignment of norms and values. Organizational changes that are aligned with the expectations of internal audience members are appealing to the norms and values of the individual, team, unit and profession (Table 2a).

[TABLE 2]

The **actual appeal** of change consists of three dimensions: (i) attitude, (ii) behavior, and (iii) evaluation. First, attitude is argued to be composed of two sub-dimensions: (a) commitment to change, and (b) opinion about change. We took Herscovitch and Meyer's (2002) scale of

organizational commitment, which includes three dimensions: (1) affective, (2) continuance, and (3) normative commitment. Commitment can be defined as "a force (mind-set) that binds an individual to a course of action deemed necessary for the successful implementation of a change initiative" (Herscovitsch and Meyer, 2002: 475). We self-developed three items regarding opinion about change, asking for an assessment of consistency, accountability and conflict during change (Table 2b). Second, behavior in response to change is a well-established construct in OB, known as behavioral adaptation. We used items from scales of Williams and Anderson, (1991) and Herscovitch and Meyer (2002) to measure behavior in response to change in terms of (1) role behavior, (2) organizational citizenship behavior directed at other individuals, and (3) organizational citizenship behavior toward the organization (Table 2c). Third, to measure evaluation, we adopted and extended the change evaluation scale from Bordia et al. (2011). The extension relates to a self-developed item regarding the individuals' attitude toward their job following the change (Table 2d).

Ex post engagement connects to the concepts of change leadership, fairness and support, well known from the OB literature. The management of change processes is vital in ensuring the acceptance of change by organizational members' (e.g., communication and training reduces the levels of uncertainty surrounding the change). Following COT logic, we developed an extra scale regarding supervisor engagement (i.e., direct internal supervision), in addition to a few established OB scales. We included an adapted version of Colquitt's (2001) scale of organizational justice as a measure of ex post engagement construct (Table 3a). Organizational justice refers to "perceptions of fairness in organizational settings" (Lord and Brown, 2003: 155), distinguishing four dimensions. Distributive justice involves "the allocation of an outcome is consistent with the goals of a particular situation" (Colquitt, 2001: 389), implying outcomes

consistent with implicit norms such as equity or equality (Lord and Brown, 2003), or whether the distribution of costs and benefits of the change are perceived as fair. Interactional justice relates to "the interpersonal treatment people receive as procedures are enacted" (Colquitt, 2001: 386) – i.e., being treated with dignity and respect during the implementation of the change (Colquitt, 2001). Procedural justice refers to fair methods used to inform decision outcomes (Lord and Brown, 2003), and is fostered through: (i) voice, (ii) influence, and (iii) adherence to fair criteria (Colquitt, 2001). Informational justice is closely related to interactional justice, referring to the relationship with the authority that enacted or implemented the change (transparency, honesty, inclusion and trustworthiness; Colquitt, 2001). Finally, we added a self-developed scale to capture HPC's (2007) argument that part of the engagement process involves (re-)designing features to match audience's preferences (HPC, 2007), implying the revision of the requirements of change (i.e., the inverse of change endurance) (Table 3b).

As control variables, we include demographic information regarding age, gender, rank, experience, and police force, and three theoretical constructs central to COT logic: change magnitude, change cascade (Table 1), and audience identity (cf. OB literature). Regarding the latter, we follow Johnson et al. (2006) and distinguish between three types of identity: comparative identity (or individual identity), concern for others (or relational identity) and group achievement focus (or collective identity) (Table 4).

[INSERT TABLES 2-4 ABOUT HERE]

PSYCHOMETRIC ANALYSIS

All items are assessed using a seven-point Likert scale. We applied exploratory factor analysis (using STATA 12) to self-developed and confirmatory factor analysis to established scales to

determine convergent and discriminant validity (Tables 5-8). For asperity (3 items), intricacy (2), opacity (2), viscosity (1), intrinsic appeal (8), change magnitude (7), and change cascade (3) items, factor loadings above 0.4 or below -0.4 are indicated in green in Table 5, typically indicating significant factor loadings. Asperity, opacity, and viscosity lack both convergent and discriminant validity in all samples, failing to sufficiently load onto one single factor. Intricacy does have convergent validity, as both items have a high factor loading on a single scale. However, the discriminant validity of this scale is not entirely satisfactory, as the third item of opacity (opac3) and the second item of change magnitude (cf_typ2) have a factor loading above 0.40 on factor F5 in the UK sample. Intrinsic appeal reveals both convergent and discriminant validity. Change magnitude (cf_typ*) has good convergent validity, but the discriminant validity is not entirely satisfactory due to the high loading of its second item on factor F5 in the UK sample. Change cascade (casc1, casc2, and casc3) has good convergent and divergent validity.

[INSERT TABLES 5-8 ABOUT HERE]

We assume that the asperity and opacity scales measure different aspects of the underlying construct. All items have face validity, which we capture by adding adjectives: deviational asperity (asp1), experimental asperity (asp2), awareness opacity (opac1), decisional opacity (opac2), and penetrability opacity (opac3) (Table 6). Table 7a highlights organizational justice scale's lack of convergent and discriminant validity. The change fairness (fair*) scale appears to suffer from a lack of discriminant validity, as the procedural justice items co-load on the same factor. The reason is that these scales are highly related and measure the same underlying construct. Therefore, we only use the change fairness scale. For leadership (Table 7b), supervisor engagement (supeng*) lacks good convergent and discriminant validity, not having high loadings. Change leadership (ch_lead*) and change support (sup*) do have good

convergent validity, albeit with minor overlap of discriminant validity. We decided to retain both change leadership and change support.

Commitment to change does not perform according to our expectations (Table 7c): continuance (ccom*) and normative commitment (ncom*) lack convergent and discriminant validity. Affective commitment (acom*) does have high convergence validity, although the discriminant validity suffers from the loading of items from continuance and normative commitment. Our measure of opinion about change (opinion) lacks convergent and divergent validity. We only include affective commitment to improve discriminant validity. Regarding the behavior component, we reveal one main factor (Table 7d). We decide to use this single factor, and select items that have a high loading (i.e., at least 0.6) on this factor (beh_ir1, beh_ir2, beh_ir3, beh_ocbi2, beh_obci_3, and beh_ocb3). For actual appeal (evaluation; Table 7e), we find that the Belgium sample lacks convergent and discriminant validity. Hence, we only retain the scale of change evaluation (eval*). Identity demonstrates good convergent validity (Table 8). Only individual identity (iself_i*) has good discriminant validity; none of its items load on other factors, and vice versa for the other items. However, the second item of collective identity also loads on the relational factor (F1) in the UK and combined sample.

Overall, the results are satisfactory for our UK and Belgian samples in terms of scale reliability, with some exceptions (Table 9). A Cronbach's alpha above 0.6 is satisfactory and above 0.7 is good (Hair et al., 1998). Internal validity and consistency range from satisfactory (intricacy) to good (all other scales).

[INSERT TABLE 9 ABOUT HERE]

Harman's one-factor test was applied to all questionnaire items to check for a potential common-method effect. For Belgium, most of the survey questions load onto eight factors, with

explained of variance of 21.8%, 8%, 6.2%, 4%, 3.4%, 3.1%, 2.8% and 2.4%. For the UK the majority of the survey questions load onto five factors, with explained variance of 28.5%, 10.4%, 4.3%, 3.8% and 3.3%. Hence, our data are unlikely to suffer from common-method bias. A few scales or sub-scales are reduced to single-item measures. In line with prior work, single-item measures do not necessarily underperform in terms of external validity (Wanous et al., 1997; Bergkvist and Rossiter, 2007). Indeed, a few of our single-item measures perform well in our three criterion-related validity analyses. Multicollinearity is not a concern.

EXTERNAL VALIDITY

We explore criterion-related and external validity by running SEM analyses on the pooled data, with intrinsic and actual appeal (attitude, behavior, and evaluation) as the dependent variables. The Chow statistic is significant for all models, except when indicated, suggesting that the data from Belgium and the UK may be pooled, as regression coefficients for the two countries tend not to differ significantly. For all Likert scales, we took the across-item average (after re-coding all reverse-coded items), applying path analysis in the form of a series of Ordinary Least Squares (OLS) regressions (using STATA 12). We estimate the standard errors using the Huber-White sandwich estimators, and cluster standard errors on the level of the police unit (Table 10). In light of the numbers of parameters in the different parts of our regression (i.e., 29, 50, 53, and 51 for the intrinsic appeal and actual appeal attitude, behavior and evaluation regressions, respectively), our sample size (629) is adequate (ranging from 12 to 22 observations per estimated parameter).

[INSERT TABLE 10 ABOUT HERE]

We find the expected significant positive path between intrinsic appeal and actual appeal (attitude, behavior, and evaluation), confirming the overall structure of our model (see Figures 1

to 4). According to COT's first Proposition 1, there is a negative relationship between organizational texture and the intrinsic appeal of organizational change. This is confirmed by our sample, as we find a significant negative effect of experimental asperity, awareness opacity and decisional opacity on intrinsic appeal (see Figure 1). Asperity (cultural restrictiveness) and opacity (limited foresight) thus lower the intrinsic appeal of organizational change. The negative impact of intricacy (interconnectedness) and viscosity (sluggishness) on intrinsic appeal, however, is not confirmed by our sample. This does not mean that these constructs do not play a role in organizational change and should be banned from the theory. The reason is that we have only used a limited number of items (intricacy: 2; viscosity: 1) to measure these constructs, and future studies could test a more extensive and diverse set of items.

According to our COT's Proposition 2, there is a positive effect of intrinsic appeal and ex post engagement on the actual appeal of organizational change. This proposition is also confirmed by our estimates. Intrinsic appeal and change support have a significant positive effect on all forms of actual appeal (attitude, behavior, and evaluation), while change fairness has a significant positive effect on the attitude dimension of actual appeal (see Figures 2 to 4). Change leadership does not seem to play an important role at all. Again, this does not invalidate the change leadership construct altogether, as more extensive studies could reveal a more complex (significant) role of change leadership (e.g., a mediation or moderation effect).

Regarding our control variables, as expected, change cascade is negatively and significantly associated with both intrinsic and actual appeal (attitude and behavior), while change revision has a positive effect on actual appeal behavior and evaluation. The magnitude of change has a significant effect on actual appeal behavior, but this does not conform to our expectations, as we find a positive instead of negative effect. The effect of relational identity is

significantly negative, and that of collective identity significantly positive, for all forms of actual appeal. Given that the Chow statistic for the actual appeal behavior part of the regression was not significant, regression coefficients for Belgium and the UK differ significantly. The model fit is good.

[INSERT FIGURE 1 TO 4 ABOUT HERE]

DISCUSSION

We re-conceptualize COT in combining micro OB with macro OT reasoning, applied to internal processes of organizational change at the individual level. Furthermore, we develop a number of survey-based measures to proxy COT's key theoretical constructs, and estimate a COT-inspired SEM with police force data from Belgium and the UK. A few organizational texture variables are significantly associated with intrinsic appeal. Asperity and opacity are of relatively greater importance than intricacy or viscosity. Additionally, relational identity, intrinsic appeal, collective identity, change support, and change revision are structurally significant. Intrinsic appeal is strongly related to actual appeal. Relational identity, collective identity, change support, and change revision are relatively important engagement variables, affecting actual appeal. The results are promising, proving evidence as to the criterion-related validity of our measures of COT constructs. From the total of 39 coefficients of COT-inspired independent and control variables, 22 are significant.

Our contribution is a first step, requiring further theoretical and methodological refinement. First, we may explore differences across types of internal audience members (e.g., according to gender and rank), and introduce interaction variables (e.g., with identity). Second, we might conduct the survey in other police forces and other types of organizations. Third, for

replication, we could improve the measurement instrument by adding extra scales and items, and collecting further data (e.g., objective HRM and performance data). Fourth, provided that the number of observations is high, we can test COT-inspired hypotheses with more complex models (e.g., with mediation and moderation effects) or at the aggregate level of (units within) organizations. Fifth, deeper insight may be gained by conducting a triangulated mixed-methods study, adding insights from rich qualitative field work to examine the underlying processes related to COT's argument as to the interlinkages between organizational texture, (ex ante and ex post) engagement and (intrinsic and actual) appeal in the context of organizational change.

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FIGURES

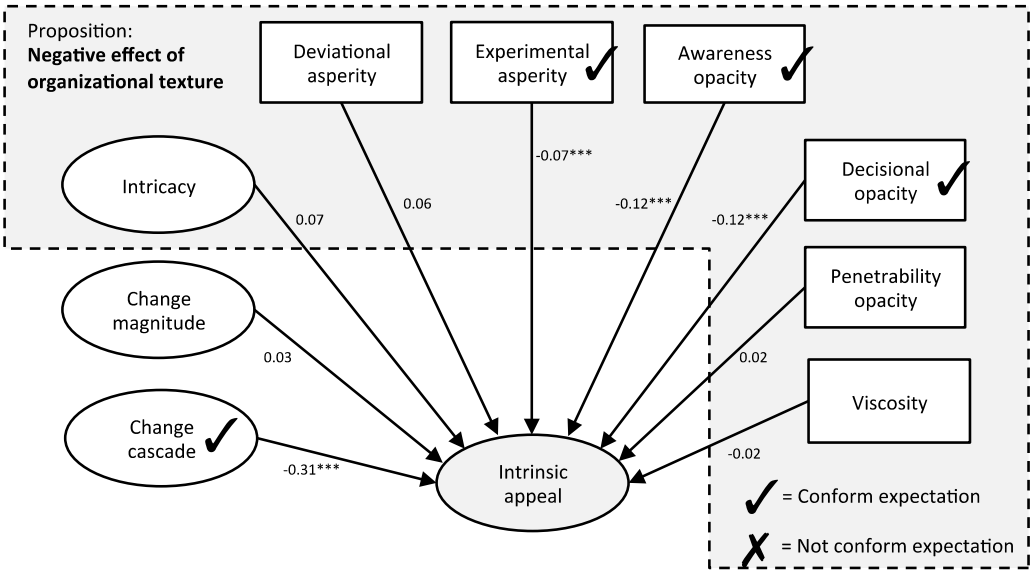

Figure 1: Structural model of intrinsic appeal

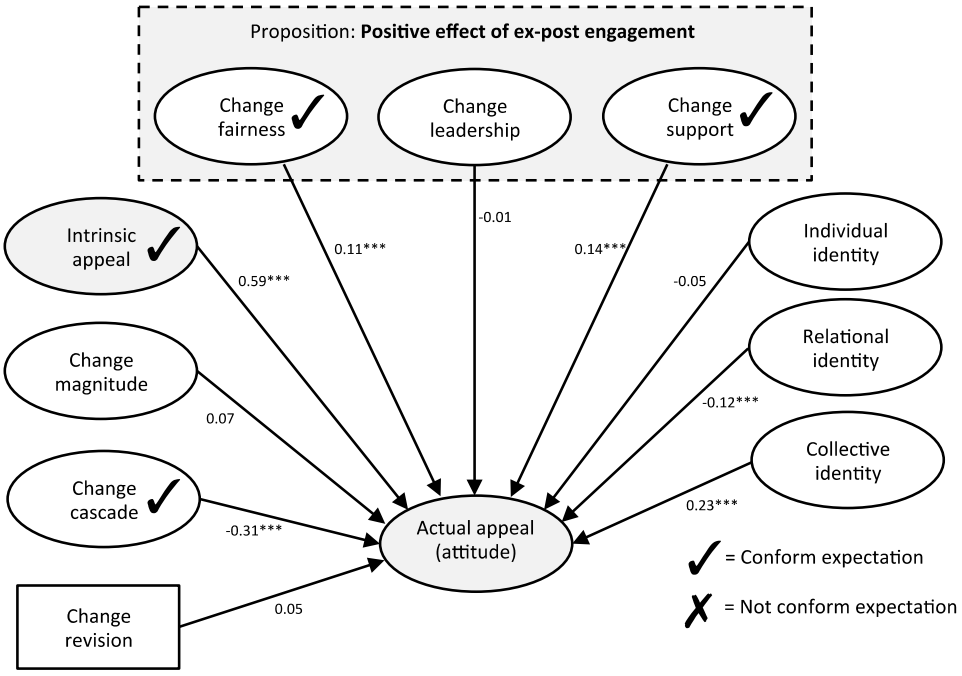

Figure 2: Structural model of actual appeal (attitude)

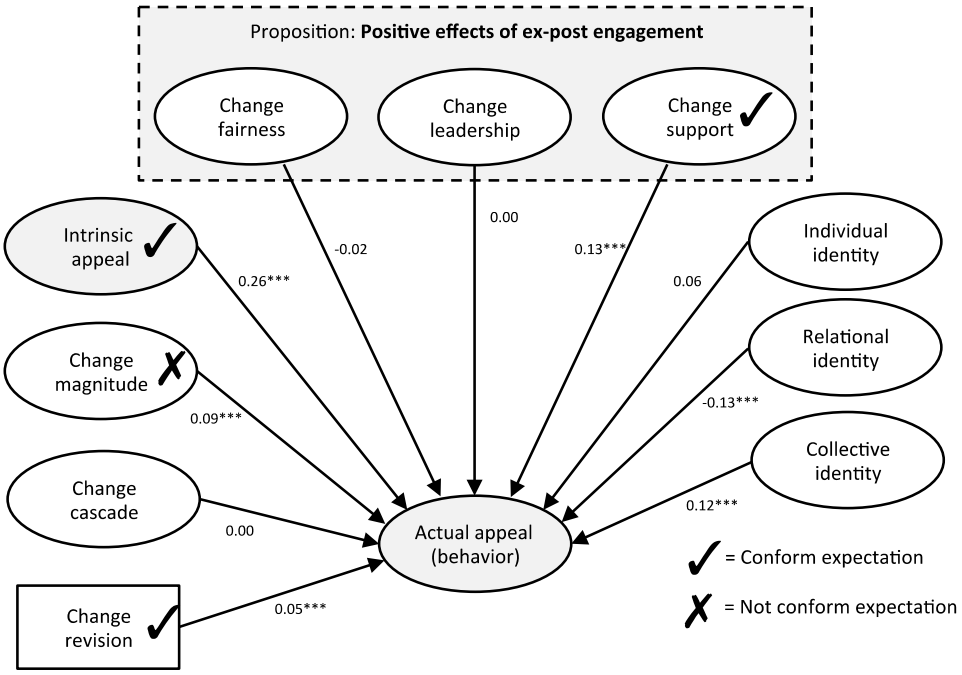

Figure 3: Structural model of actual appeal (behavior)

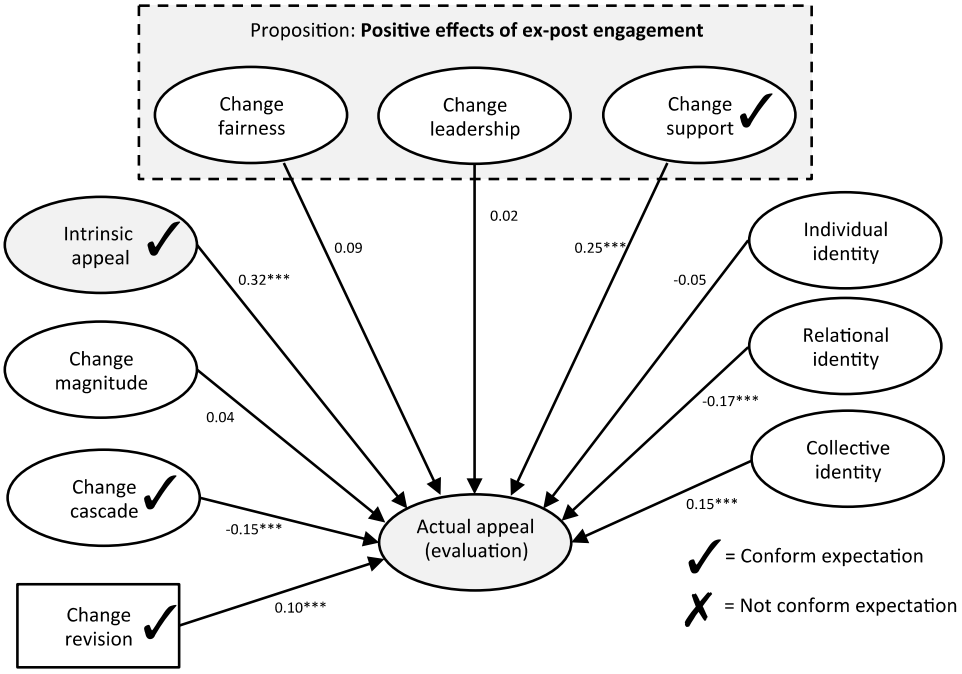

Figure 4: Structural model of actual appeal (evaluation)

Table 1: Scale Items of Organizational Texture and Change Cascade

Scale	**Organizational opacity (OPAC) – self developed (sd)**
OPAC1***R**	(before the change) Management was generally aware of the work conditions of its employees
OPAC2	(“) Important managerial decisions were made without reliance on well-documented information
OPAC3	(“) It took a long time for a rookie to understand how things are done in my unit
Scale	**Organizational intricacy (INTR) – (sd)**
INTR1	(“) My unit’s main activity depended on collaboration and mutual adjustments with many other units
INTR2	(“) The nature of the work in my unit depended on which other units we were working with
Scale	**Cultural asperity (ASP) – (sd)**
ASP1	(“) Within our unit deviations from standard procedures required justification
ASP2***R**	(“) Within our unit managers allowed room for experimentation
Scale	**Organizational viscosity (VISC) – (sd)**
VISC1***R**	(“) Disagreements about work were usually quickly resolved in my work group/unit
Scale	**Change magnitude (CH_TYP) – (sd) (CONTROL VARIABLE)**
CF_TYP1	This change project asked for a radical departure from previous work practices
CF_TYP2	“ affected the technology used by your unit
CF_TYP3	“ changed the personnel composition of your unit
CF_TYP4	“ changed how your unit interacts with the public
CF_TYP5	“ changed the staffing of leadership roles in your unit
CF_TYP6	“ affected how leadership interacted with you and your colleagues
CF_TYP7	“ influenced what you and your colleagues consider the right way to do things on the job
Scale	**Change cascade (CASC) – (sd)**
CASC1	When this change was first announced I had no idea how complex it would be
CASC2	When it was first announced I had no idea how much of the organization would be impacted by the change
CASC3	“ announced I had no idea how long the change would take

***R** = reverse coded item; Change magnitude is a control variable.

Table 2: Scale Items of Appeal – Intrinsic appeal

Table 2a: Intrinsic appeal	
Item	**Alignment of expectations (EXPECT) – (sd)**
	The goals of this change were consistent with my views about:
EXPECT1	… how to do my job properly
EXPECT2	… how my work group should function
EXPECT3	… " force should operate
EXPECT4	…" profession should behave
Item	**Alignment of norms and values (NORM) – (sd)**
	The goals of this change were aligned with the norms and values of:
NORM1	… me as an individual
NORM2	… my team
NORM3	… the force
NORM4	… the police profession
Table 2b: Actual appeal attitude	
Scale	**Commitment to change – (Herscovitch and Meyer, 2002)**
Subscale	*Affective commitment (ACOM)*
ACOM1	I believed in the value of this change
ACOM2	This change served an important purpose
ACOM3	This change was a good strategy for this organization
Subscale	*Continuance commitment(CCOM)*
CCOM1	Resisting this change was not a viable option for me
CCOM2	I have no choice but to go along with this change
CCOM3	I had too much at stake to resist this change
Subscale	*Normative commitment (NCOM)*
NCOM1	I felt a sense of duty to work toward this change
NCOM2	I would have felt guilty about opposing this change
NCOM3	I did not feel any obligation to support this change
Scale	**Opinions about the change (OPINION) – (sd)**
OPINION1	During this change we did things more consistently in my unit
OPINION2	" we had more accountability for completion of tasks in my unit
OPINION3	" there was more conflict than usual in my unit

Table 2c: Actual appeal behavior	
Scale	**Reaction toward change (REAC) – (Herscovitch and Meyer, 2002)**
	Please check one single answer that best describes your initial reaction to the change:
	• I actively and openly acted to block the change
	• I acted behind the scenes to block the change
	• I accepted the change with reservation(s)
	• I accepted the change without reservation
	• I actively and openly supported the change
	• I became one of the leading advocates of the change
Scale	**IRB, OCBI, and OCB – (Williams and Andersen, 1991)**
Subscale	*In role behavior (BEH_IR)*
	As a result of this change:
BEH_IR1	… I better perform tasks that were expected of me
BEH_IR2	… I better fulfill the responsibilities specified in my job description
BEH_IR3	… I more adequately complete assigned duties
Subscale	*Organizational citizenship behavior – individuals (BEH_OCBI)*
	As a result of this change:
BEH_OCBI1	… I increasingly help others who had been absent
BEH_OCBI2	… " help others who had a heavy work load
BEH_OCBI3	… " take a personal interest in other employees
Subscale	*Organizational citizenship behavior (BEH_OCB)*
	As a result of this change:
BEH_OCB1	… I increasingly give advance notice when unable to come to work
BEH_OCB2	… my attendance at work is better
BEH_OCB3	… I take more undeserved work breaks
Table 2d: Actual appeal evaluation	
Scale	**Change evaluation (EVAL) – (Bordia et al., 2011)**
EVAL1	The change achieved its intended purpose
EVAL2	" was managed well
EVAL3	" has improved our unit's performance and effectiveness
EVAL4	" has made my police force more effective
Scale	**Consequences of change (CHU_EV) – (sd)**
CHU_EV1	As a result of this change we do things more consistently in my unit
CHU_EV2	" have more accountability for completion of tasks in my unit
Scale	**Response to change (RESP) – (sd)**
RESP1	As a result of this change I began thinking more about quitting the job

Table 3a: Scales and Items for Ex Post Engagement – Leadership, support and fairness

Scale	**Change leadership (CH_LEAD) – (Herold, Fedor, Caldwell, and Lui, 2008)**
	Our senior leadership team …
CH_LEAD1	… developed a clear vision for what was going to be achieved by our division
CH_LEAD2	… made it clear up front to those in our division why the change was necessary
CH_LEAD3	… made a case for the urgency of this change prior to implementation
CH_LEAD4	… built a broad coalition up front to support the change
CH_LEAD5	… empowered people to implement the change
CH_LEAD6	… carefully monitored and communicated progress of the implementation of the change
CH_LEAD7	… gave individual attention to those who had trouble with the implementation of the change
Scale	**Change fairness (SUP) – (Caldwell, Herold, and Fedor, 2004)**
Subscale	*Change fairness*
FAIR1	Sufficient advanced notice was given to employees affected by the change
FAIR2	Those affected by the change had ample opportunities for input
FAIR3	The force kept everyone fully informed during the change
Scale	**Change support (SUP) – (Caldwell, Herold, and Fedor, 2004)**
SUP1	All levels of our command team were committed to this change
SUP2	There was sufficient command team support for this change
SUP3	Our command team was supportive of this change
Scale	**Supervisor engagement (SUPENG) – (sd)**
	Our senior leadership team …
SUPENG1	… provided an adequate explanation for why the change was necessary
SUPENG2	… failed to inform me about how it would affect me
SUPENG3	… kept me fully informed during the change
SUPENG4	… were not committed to this change
SUPENG5	… dealt quickly and effectively with “surprises” during the change

Table 3b: Scales and Items of Ex Post Engagement – Organizational justice

Scale	**Organizational justice – adapted from Colquitt (2001)**
Subscale	*Distributive justice (JUST_D)*
	The following items refer to the outcomes of the change for you. To what extent:
JUST_D1	Do the outcomes reflect the effort that you have put into your work?
JUST_D2	Are the outcomes appropriate for the work you have completed?
JUST_D3	Do the outcomes reflect what you have contributed to the force?
JUST_D4	Are the outcomes justified, given your performance?
JUST_D5	Are the benefits of the change distributed fairly?
JUST_D6	Is the harm of the change shared evenly across the force?
Subscale	*Interactional justice (JUST_INT)*
	The following items refer to your supervisor during the change. To what extent:
JUST_INT1	Has he/she treated you in a polite manner?
JUST_INT3	"treated you with dignity?
JUST_INT2	"treated you with respect?
Subscale	*Procedural justice (JUST_P)*
	The following items refer to the implementation of the change. To what extent:
JUST_P1	Have you been able to express your views and feelings?
JUST_P2	" had influence over the change process?
JUST_P3	Has the change been implemented consistently?
JUST_P4	" implementation upheld ethical and moral standards?
Subscale	*Informational justice (JUST_INF)*
	The following items refer to your supervisor during the change. To what extent:
JUST_INF1	Has he/she been candid in his/her communications with you?
JUST_INF2	" explained the change thoroughly?
JUST_INF3	Were his/her explanations regarding the change reasonable?
JUST_INF4	" communicated details in a timely manner?
Scale	**Revision of change goals (CF_REV) – (sd)**
CF_REV1	The requirements of the change were often revised

Table 4: Individual, Relational and Collective Identity Scales and Items

Scale	**Levels of self-concept scale – (Johnson et al., 2006)**
	Individual level - comparative identity (self_i)
SELF_I1	I thrive on opportunities to show that my abilities are better than others.
SELF_I2	I have a strong need to know how I stand in comparison to my coworkers.
SELF_I3	I often compete with my friends.
SELF_I4	I feel best about myself when I perform better than others.
	Relational level - concern for others (self_r)
SELF_R1	If a friend is in trouble, I would sacrifice time and/or money to help him/her.
SELF_R2	I value friends who are caring, empathic individuals.
SELF_R3	It is important to uphold my commitments to significant others in my life.
SELF_R4	Caring deeply about a close friend or relative is important to me.
	Collective level – Group achievement focus subscale (self_c)
SELF_C1	Making a lasting contribution to my unit or force is very important to me.
SELF_C2	When I become involved in a work group, I do my best to ensure its success.
SELF_C3	I feel great pride when my team or group does well, even if I'm not the main reason for its success.
SELF_C4	I would be honored to represent my force at a conference or meeting.

Table 5: Exploratory Factor Analysis Self-Developed Scales and Items

	Combined						UK						Belgian					
Item	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6	F1	F2	F3	F4	F5	F6
EXPECT1	0.86	-0.08	0.01	0.08	0.04	0.03	0.85	-0.11	0.00	0.07	0.10	0.07	0.86	0.15	0.06	-0.01	-0.02	-0.17
EXPECT2	0.85	-0.11	0.02	0.08	0.04	0.01	0.84	-0.14	0.02	0.06	0.10	0.07	0.87	0.11	0.06	0.06	0.00	-0.16
EXPECT3	0.88	-0.06	-0.04	0.07	0.07	-0.01	0.87	-0.07	-0.03	0.09	0.09	0.05	0.85	0.03	-0.06	0.10	0.01	-0.21
EXPECT4	0.79	0.00	0.00	-0.02	0.06	0.06	0.78	-0.04	0.01	0.06	0.02	0.12	0.78	0.10	-0.04	0.07	-0.15	-0.21
NORM1	0.87	-0.12	0.00	-0.01	-0.02	-0.04	0.87	-0.09	0.02	-0.04	-0.05	-0.06	0.91	0.02	-0.07	0.00	0.12	0.05
NORM2	0.87	-0.17	-0.01	-0.01	-0.02	-0.04	0.87	-0.13	-0.01	-0.04	-0.05	-0.08	0.89	0.03	-0.07	0.03	0.17	0.07
NORM3	0.85	-0.16	0.02	0.00	0.02	-0.09	0.87	-0.11	0.05	0.00	-0.01	-0.13	0.82	-0.10	-0.20	0.09	0.03	0.16
NORM4	0.86	-0.14	0.00	-0.04	0.01	-0.08	0.87	-0.08	0.02	-0.02	-0.07	-0.10	0.85	-0.06	-0.12	0.09	0.09	0.06
OPAC1	0.21	-0.05	0.03	0.32	0.41	-0.34	0.20	-0.01	0.06	0.41	0.28	-0.33	0.18	0.01	-0.14	0.66	0.32	-0.05
OPAC2	-0.17	0.07	0.17	-0.04	-0.04	0.73	-0.16	0.11	0.18	0.01	-0.01	0.72	-0.26	0.10	0.04	-0.57	-0.05	0.50
OPAC3	0.00	0.04	0.10	0.39	-0.48	0.24	0.02	0.00	0.09	-0.43	0.41	0.26	-0.02	0.05	0.13	-0.68	0.36	0.05
INTR1	0.03	0.02	0.01	0.82	0.14	-0.07	0.01	0.05	0.03	0.15	0.81	-0.06	0.11	0.02	-0.15	0.21	0.76	0.04
INTR2	0.08	0.06	-0.05	0.75	-0.15	0.17	0.07	0.00	-0.07	-0.16	0.75	0.19	0.11	0.17	0.08	-0.10	0.77	-0.08
ASP1	0.07	-0.04	-0.07	0.20	-0.08	0.67	0.10	-0.07	-0.08	-0.15	0.23	0.62	-0.06	0.07	0.04	0.10	0.08	0.72
ASP2	0.10	0.07	0.05	0.12	0.70	-0.22	0.09	0.05	0.05	0.78	0.09	-0.16	0.24	-0.18	0.04	0.22	0.27	-0.60
VISC1	0.03	0.03	-0.05	-0.03	0.86	0.08	0.02	0.08	-0.06	0.84	-0.07	0.09	0.08	-0.09	0.00	0.74	0.10	0.10
CF_TYP1	-0.20	0.63	0.03	0.08	0.16	0.15	-0.21	0.54	0.05	0.20	0.11	0.05	-0.06	0.73	-0.05	-0.08	0.10	0.20
CF_TYP2	-0.01	0.56	0.06	0.36	0.00	-0.05	-0.04	0.48	0.07	0.00	0.40	-0.19	0.18	0.66	0.06	-0.10	0.34	0.07
CF_TYP3	-0.16	0.77	0.03	-0.06	0.02	0.05	-0.15	0.72	0.02	0.08	-0.09	0.12	-0.02	0.67	0.14	0.03	0.00	-0.05
CF_TYP4	-0.23	0.76	-0.03	0.00	-0.02	0.02	-0.25	0.73	-0.04	-0.03	0.04	-0.02	0.07	0.70	0.05	-0.12	-0.09	0.11
CF_TYP5	-0.12	0.82	0.00	-0.06	0.02	0.00	-0.09	0.79	-0.02	0.08	-0.06	0.08	0.08	0.75	0.10	-0.06	-0.12	-0.16
CF_TYP6	-0.13	0.79	0.07	0.04	0.01	-0.03	-0.12	0.79	0.06	0.04	0.03	-0.02	0.01	0.70	0.10	-0.01	0.14	0.11
CF_TYP7	-0.17	0.74	0.09	0.12	-0.01	-0.03	-0.20	0.70	0.13	-0.04	0.15	-0.07	0.10	0.80	-0.01	0.06	0.07	0.00
CASC1	0.00	0.09	0.85	0.04	-0.04	-0.01	0.05	0.07	0.86	-0.01	0.06	0.01	-0.20	0.10	0.80	-0.12	-0.02	-0.08
CASC2	-0.01	0.06	0.90	-0.05	-0.01	-0.02	0.00	0.03	0.91	0.00	-0.04	-0.02	-0.05	0.11	0.87	-0.03	-0.09	-0.02
CASC3	0.00	-0.06	0.87	0.00	0.01	0.09	0.01	-0.01	0.90	0.00	-0.02	0.07	-0.07	-0.09	0.65	-0.02	0.19	0.37

Table 6: Definition of Items of Non-Validated Scales

Item	Question	Name
ASP1	Within our unit deviations from standard procedures required justification	Deviational asperity
ASP2*	" managers allowed room for experimentation	Experimental asperity
OPAC1*	Management was generally aware of the work conditions of its employees	Awareness opacity
OPAC2	Important managerial decisions were made without reliance on well-documented information	Decisional opacity
OPAC3	It took a long time for a rookie to understand how things are done in my unit	Penetrability opacity

* Reverse coded items

Table 7: Confirmatory Factor Analysis of Appeal Scales and Items

Table 7a: Justice										
	Combined sample			UK sample			Belgian sample			
Item	F1	F2	F3	F1	F2	F3	F1	F2	F3	F4
JUST_D3	0.13	0.89	0.08	0.16	0.12	0.86	0.15	0.07	0.88	-0.12
JUST_D4	0.13	0.88	0.10	0.15	0.13	0.86	0.15	0.15	0.88	-0.05
JUST_INT1	0.90	0.05	0.05	0.91	0.03	0.03	0.84	0.17	0.03	-0.22
JUST_INT2	0.92	0.07	0.08	0.91	0.06	0.08	0.93	0.16	0.05	-0.09
JUST_INT3	0.91	0.05	0.08	0.91	0.06	0.06	0.91	0.15	0.02	-0.09
JUST_INF1	0.74	0.10	0.11	0.71	0.11	0.09	0.88	0.12	0.17	0.07
JUST_INF2	0.83	0.17	0.16	0.83	0.19	0.18	0.82	0.06	0.24	0.12
JUST_INF3	0.82	0.21	0.16	0.81	0.16	0.23	0.83	0.18	0.23	0.06
JUST_INF4	0.88	0.08	0.15	0.89	0.14	0.10	0.82	0.12	0.27	0.18
JUST_P1	0.18	0.44	0.53	0.17	0.56	0.44	0.24	0.44	0.57	0.15
JUST_P2	0.04	0.55	0.31	0.04	0.30	0.57	0.19	0.47	0.56	0.18
JUST_P3	0.15	0.58	0.43	0.16	0.50	0.53	0.30	0.28	0.41	-0.49
JUST_P4	0.19	0.57	0.40	0.19	0.45	0.54	0.36	0.30	0.33	-0.18
FAIR1	0.19	0.01	0.80	0.15	0.78	0.03	0.17	0.88	0.12	-0.02
FAIR2	0.08	0.29	0.76	0.10	0.77	0.27	0.15	0.84	0.13	-0.02
FAIR3	0.18	0.15	0.83	0.14	0.85	0.13	0.23	0.76	0.16	-0.04

Table 7b: Leadership							
	Combined		UK		Belgium		
Item	F1	F2	F1	F2	F1	F2	F3
CH_LEAD1	0.79	0.22	0.80	0.20	0.77	0.25	0.28
CH_LEAD2	0.80	0.20	0.82	0.20	0.72	0.19	0.27
CH_LEAD3	0.71	0.22	0.77	0.28	0.59	-0.07	0.41
CH_LEAD4	0.74	0.28	0.77	0.24	0.69	0.38	-0.02
CH_LEAD5	0.70	0.29	0.73	0.23	0.58	0.49	-0.09
CH_LEAD6	0.83	0.21	0.83	0.20	0.84	0.19	-0.04
CH_LEAD7	0.74	0.16	0.75	0.11	0.69	0.37	-0.16
SUP1	0.17	0.78	0.19	0.78	0.11	0.82	-0.04
SUP2	0.36	0.73	0.40	0.69	0.30	0.78	-0.02
SUP3	0.25	0.83	0.27	0.81	0.20	0.82	0.20
SUPENG1	0.78	0.23	0.77	0.22	0.80	0.23	0.27
SUPENG2	-0.47	-0.12	-0.44	-0.11	-0.55	-0.24	0.09
SUPENG3	0.72	0.21	0.71	0.21	0.80	0.17	-0.14
SUPENG4	0.01	-0.52	0.01	-0.69	-0.01	-0.07	-0.82
SUPENG5	0.72	0.11	0.73	0.11	0.69	0.09	-0.17

Table 7c: Attitude												
	Combined sample				UK sample				Belgian sample			
Item	F1	F2	F3	F4	F1	F2	F3	F4	F1	F2	F3	F4
ACOM1	0.87	0.11	-0.05	-0.05	0.85	0.14	-0.04	0.00	0.86	0.26	-0.11	0.02
ACOM2	0.85	0.19	0.05	-0.07	0.84	0.23	0.04	-0.07	0.79	0.37	0.01	0.05
ACOM3	0.82	0.21	-0.09	-0.10	0.80	0.25	-0.05	-0.09	0.87	0.14	-0.08	0.07
NCOM1	0.64	0.07	0.39	0.24	0.67	0.08	0.28	0.31	0.36	0.81	0.04	0.04
NCOM2	0.33	0.07	0.59	0.20	0.24	0.08	0.70	0.15	0.45	0.58	0.21	-0.03
NCOM3	-0.37	0.15	-0.39	0.12	-0.42	0.22	-0.11	-0.09	-0.22	-0.75	0.15	-0.06
CCOM1	0.06	-0.09	0.07	0.83	0.03	-0.09	0.08	0.84	0.10	0.08	0.86	0.01
CCOM2	-0.42	0.03	0.15	0.66	-0.42	0.04	0.30	0.54	-0.35	-0.15	0.71	-0.14
CCOM3	-0.13	0.14	0.75	0.18	-0.06	0.08	0.78	0.10	-0.27	0.46	0.36	0.31
OPINION1	0.21	0.88	-0.06	-0.01	0.20	0.89	-0.03	0.00	0.53	-0.29	0.08	0.43
OPINION2	0.12	0.88	0.13	-0.05	0.17	0.88	0.11	-0.05	0.14	0.06	-0.10	0.87
OPINION3	-0.29	-0.22	0.49	-0.24	-0.16	-0.34	0.48	-0.39	-0.39	0.12	0.20	0.48

Table 7d: Behavior						
	Combined		UK		BE	
Variable	F1	F2	F1	F2	F1	F2
REAC	0.42	-0.40	0.46	-0.46	0.28	0.74
BEH_IR1	0.83	0.10	0.83	0.05	0.83	0.00
BEH_IR2	0.83	0.11	0.84	0.08	0.81	0.03
BEH_IR3	0.79	0.22	0.78	0.26	0.84	0.01
BEH_OCBI2	0.60	-0.31	0.59	-0.36	0.75	-0.21
BEH_OCBI3	0.75	-0.12	0.73	-0.12	0.80	0.01
BEH_OCB2	0.60	0.27	0.52	0.40	0.85	0.13
BEH_OCB3	0.18	0.83	0.17	0.78	0.34	-0.66

Table 7e: Evaluation				
	Combined	UK	Belgium	
Item	Factor1	Factor1	Factor1	Factor2
EVAL1	0.81	0.80	0.86	0.21
EVAL2	0.79	0.79	0.82	0.13
EVAL3	0.89	0.89	0.76	0.41
EVAL4	0.88	0.87	0.92	0.19
CHU_EV1	0.74	0.75	0.38	0.76
CHU_EV2	0.54	0.57	0.08	0.90
RESP1	-0.63	-0.63	-0.62	0.12

Table 8: Exploratory factor analysis of identity scales and items

	Combined sample			UK sample			Belgian sample		
Item	**F1**	**F2**	**F3**	**F1**	**F2**	**F3**	**F1**	**F2**	**F3**
SELF_I1	0.17	0.22	0.71	0.17	0.70	0.25	0.09	0.10	0.79
SELF_I2	0.07	0.33	0.68	0.08	0.72	0.32	0.21	0.21	0.53
SELF_I3	-0.04	0.06	0.79	-0.03	0.80	0.06	-0.25	0.08	0.73
SELF_I4	0.02	0.11	0.83	0.03	0.83	0.11	0.08	0.06	0.83
SELF_R1	0.71	0.24	0.00	0.72	-0.02	0.22	0.64	0.38	0.09
SELF_R2	0.73	0.28	0.06	0.72	0.07	0.28	0.79	0.21	0.00
SELF_R3	0.75	0.10	0.11	0.76	0.12	0.07	0.71	0.27	0.11
SELF_R4	0.79	0.09	-0.03	0.79	-0.03	0.09	0.81	0.10	-0.06
SELF_C1	0.30	0.79	0.21	0.32	0.24	0.78	0.20	0.77	0.10
SELF_C2	0.57	0.61	0.14	0.60	0.17	0.58	0.40	0.74	0.03
SELF_C3	0.37	0.74	0.17	0.36	0.21	0.73	0.40	0.73	-0.02
SELF_C4	-0.07	0.79	0.12	-0.08	0.10	0.80	-0.06	0.76	0.26

Table 9: Cronbach Alpha's, Sample Means, Standard Deviations and Correlations

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	Intrinsic appeal (0.95 / 0.95 / 0.95)*	3.28	1.44																
2.	Deviational asperity (NA)	4.56	1.51	0.06															
3.	Experimental asperity (NA)	3.77	1.72	-0.13***	0.15***														
4.	Intricacy (0.64 / 0.63 / 0.68)	3.93	1.42	0.09**	0.16***	-0.10***													
5.	Awareness opacity (NA)	4.38	1.83	-0.23***	0.04	0.26***	-0.16***												
6.	Decisional opacity (NA)	4.38	1.52	-0.19***	0.14***	0.15***	0.04	0.19***											
7.	Penetrability opacity (NA)	3.60	1.59	-0.01	0.20***	0.16***	0.22***	0.14***	0.15***										
8.	Viscosity (NA)	4.69	1.75	0.06*	-0.05	-0.41***	-0.02	-0.22***	-0.08**	-0.27***									
9.	Change magnitude (0.87 / 0.82 / 0.84)	4.77	1.44	-0.30***	-0.02	-0.09**	0.11***	0.03	0.12***	0.06	0.05								
10.	Change cascade (0.85 / 0.87 / 0.72)	4.43	1.43	0.00	-0.01	-0.02	-0.01	0.00	0.13***	0.08**	-0.04	0.08**							
11.	Individual identity (0.78 / 0.78 / 0.72)	4.05	1.24	0.13***	0.05	-0.03	0.08**	0.00	-0.09**	0.06*	-0.02	0.06	-0.02						
12.	Relational identity (0.79 / 0.79 / 0.79)	5.93	0.89	-0.09**	0.00	-0.17***	0.03	-0.01	-0.04	0.01	0.16***	0.13***	0.07*	0.17***					
13.	Collective identity (0.80 / 0.81 / 0.78)	5.23	1.15	0.20***	0.04	-0.18***	0.12***	-0.14***	-0.11***	0.04	0.16***	0.01	-0.02	0.42***	0.52***				
14.	Change fairness (0.82 / 0.82 / 0.87)	3.84	1.58	0.41***	0.06	-0.14***	0.02	-0.28***	-0.22***	-0.04	0.11***	-0.09**	-0.05	0.06*	0.00	0.21***			
15.	Change support (NA)	4.09	1.40	0.30***	0.03	-0.11***	0.01	-0.19***	-0.13***	-0.01	0.07*	0.02	-0.03	0.06	0.05	0.15***	0.53***		
16.	Change leadership (0.81 / 0.81 / 0.80)	3.63	1.33	0.57***	0.01	-0.22***	0.03	-0.33***	-0.24***	-0.05	0.15**	-0.13***	-0.03	0.13***	0.00	0.27***	0.66***	0.54***	
17.	Change revision (NA)	3.98	1.68	0.08**	0.05	-0.09**	0.13***	-0.14***	0.02***	0.00	0.00	-0.05	0.22***	0.04	-0.01	0.05	0.05	0.04	0.12***

*With Cronbach Alpha's in parentheses for multi-item scales (Combined / UK / BE); For Actual Appeal, these are 0.89 / 0.89 / 0.83 (Attitude), 0.80 / 0.79 / 0.89 (Behavior), and 0.90 / 0.89 / 0.91 (Evaluation).

Table 10: Results from Structure Equation Modeling – Intrinsic Appeal – Engagement

Variable	Coefficient	Std. error
DV: Intrinsic appeal		
Deviational asperity	0.06	0.044
Experimental asperity	-0.07**	0.033
Intricacy	0.07	0.050
Awareness opacity	-0.12***	0.042
Decisional opacity	-0.12***	0.043
Penetrability opacity	0.02	0.035
Viscosity	-0.02	0.028
Change cascade	-0.31***	0.056
Change magnitude	0.03	0.032
Constant	5.43***	0.535
DV: Attitude		
Intrinsic appeal	0.59***	0.051
Individual identity	-0.05	0.042
Relational identity	-0.12**	0.055
Collective identity	0.23***	0.054
Change fairness	0.11***	0.038
Change leadership	-0.01	0.049
Change support	0.14**	0.057
Change revision	0.05	0.029
Change cascade	-0.17***	0.030
Change magnitude	-0.01	0.037
Constant	0.77**	0.374
DV: Behavior		
Intrinsic appeal	0.26***	0.034
Individual identity	0.06	0.034
Relational identity	-0.13***	0.038
Collective identity	0.12***	0.032
Change fairness	-0.02	0.035
Change leadership	0.00	0.039
Change support	0.13***	0.049
Change revision	0.05**	0.021
Change cascade	0.00	0.049
Change magnitude	0.09***	0.033
Constant	1.23***	0.288

Continued/…

Table 10: continued…/ regression results

Variable	Coefficient	Std. error
DV: Evaluation		
Intrinsic appeal	0.32***	0.038
Individual identity	-0.05	0.050
Relational identity	-0.17***	0.042
Collective identity	0.15**	0.062
Change fairness	0.09	0.053
Change leadership	0.02	0.039
Change support	0.25***	0.058
Change revision	0.10***	0.014
Change cascade	-0.15***	0.042
Change magnitude	0.04	0.039
Constant	0.96**	0.377
var(e.intrinsic)	1.74	0.103
var(e.affective)	1.31	0.100
var(e.behavior)	0.83	0.035
var(e.evaluation)	1.06	0.082
Observations	629	
Log pseudo-likelihood	-20,876.43	

Legend: *** p < 0.01; ** p < 0.05; * p < 0.1